STIC Scientific and Technical Information Center

EIC 2800 SEARCH REPORT

SIRA Delivering Technologies for Patents

STIC Database Tracking Number: 315994

To: MATTHEW SUCH	From: SCOTT SEGAL
Location: JEF-6B85	Location: EIC2800
Art Unit: 2891	JEF-4B55
Thursday, December 03, 2009	Phone: (571)272-1314
Case Serial Number: 10/573,883	scott.segal@uspto.gov

Search Notes

Re: 2,7-Carbazolenevinylene Derivatives as Novel Materials in Producing Organic Based Electronic Devices

Examiner Such:

Attached are edited search results from the patent and NPL literature in STN. Databases searched included CAS Registry and Chemical Abstracts. While I did find some NPL that pre-dates the application date, all citations found were authored by the same Assignees and Inventors as 10/573,883. For your interest, I have included some of their newer citations as well.

The **asterisked** items are some of the results worth your review (pre-dating the Filing Date). However, I recommend that you browse all the results.

If you would like more searching to be done on this case, or if you have questions or comments, please do not hesitate to contact me.

Respectfully,
Scott

Scott Segal
Searcher, STIC-EIC2800
JEF-4B55, 571-272-1314

STIC Scientific and Technical Information Center

VOLUNTARY SEARCH FEEDBACK

SIRA Delivering Technologies for Patents

Art Unit _____ App./Serial # _____

How did you use your search results?

You may cut and paste into the box below

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited in allowance

} Citations or Patents Used

In brief - citation #, author, or patent #

- ☐ Helped better understand state of the art in technology, or specific invention
- ☐ Results verified the lack of relevant prior art (helped determine patentability).

Types ☐ Patent(s) ☐ Non-Patent Literature

COMMENTS

Questions about the scope or the results of the search?
Contact your EIC searcher or EIC Supervisor.

Please submit completed form to your EIC.

01/09

STIC USE ONLY

Today's Date _____

Additional Notes if applicable (please indicate all actions including emails, phone calls, and individuals assisting):

315994

STIC Scientific and Technical Information Center

EIC 2800
SEARCH REQUEST

SIRA Delivering Technologies for Patents

DEC 2 2009

Today's Date 12/2/2009

Name MATTHEW W. SUCH	Priority App. Filing Date 10/2/2003
AU/Org. 2891 Employee # 81973	Case/App. # 10/573883
Bld.&Rm.# JEF 6B85 Phone 2-8895	**Format for Search Results** EMAIL X PAPER ___

If this is an Appeals case, check here ☐

Describe this invention in your own words

Please search the 4 compounds listed on the attached page.

Synonyms Thanks!

Additional Comments

Please submit completed form to your EIC.

STIC USE ONLY 01/09

Searcher Scott Segal Date Completed 12/3/09

Phone 2-1314 Sources CAS Registry, Chemical Abstracts

~~10/573833~~ 10/573883

Priority Date: 2 October 2003

(1) 1,4-bis(vinylene-(N-methyl-7-hexyl-2-carbazole))phenylene

(2) 1,4-bis(vinylene-(N-hexyl-2-carbazole))phenylene

(3) [Poly (N-(2-ethylhexyl-2,7-carbazolenevinylene- co-2,5-bis(diphenylamine)-1,4-phenylenevinylene-co-((4-(2-ethylhexyloxy)- phenyl)-bis-(4'-phenylene)amine)]

(4) [Poly (N-(4-hexyloxyphenyl)-2,7-carbazolenevinylene-alt-(3-hexyl-2,5-thiophenevinylene))]

Search History

10/573,883 12/3/09 **STN**

10:06:08 ON 03 DEC 2009
11:46:38 ON 03 DEC 2009

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FILE 'HCAPLUS' ENTERED AT 10:06:16 ON 03 DEC 2009
L1             0 SEA ABB=ON  PCVDPATA
L2             0 SEA ABB=ON  PPCVT
L3             4 SEA ABB=ON  RCPCR
                 D ALL 1-4

FILE 'REGISTRY' ENTERED AT 10:07:52 ON 03 DEC 2009
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                 D L4 SQIDE 1-
                 SET NOTICE LOGIN DISPLAY
L5             1 SEA ABB=ON  887781-96-6/RN
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L6             0 SEA ABB=ON  RCPCR/CN
L7             2 SEA ABB=ON  CPC/CN
                 D 1-2
L8             0 SEA ABB=ON  PCVDPAP/CN
L9             0 SEA ABB=ON  PCVDPAP
L10            0 SEA ABB=ON  PCVDPATA
L11            0 SEA ABB=ON  PCVDPATA/CN
                 E 1,4-BIS{VINYLENE-(N-METHYL-7-HEXYL?/CN
                 E 1,4-BIS{VINYLENE-(N-METHYL-7/CN
                 E 1,4-BISVINYLENE-(N-METHYL-7/CN
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L13            3 SEA ABB=ON  ?HEXYL-2-CARBAZOLE?
L14            1 SEA ABB=ON  ?ETHYLHEXYL-2,7-CARBAZOLENEVINYLENE?
L15            0 SEA ABB=ON  ?HEXYLOXYPHENYL(W)2,7-CARB?
L16            0 SEA ABB=ON  ?HEXYLOXYPHENYL(1W)2,7-CARB?
L17          971 SEA ABB=ON  ?HEXYLOXYPHENYL?
L18            0 SEA ABB=ON  ?HEXYLOXYPHENYL? AND ?CARBAZOLENE?
L19            0 SEA ABB=ON  ?HEXYLOXYPHENYL? AND ?THIOPHENEVINYLENE?
L20           30 SEA ABB=ON  ?THIOPHENEVINYLENE?
L21            0 SEA ABB=ON  L20 AND ?HEXYLOXYPHENYL?
L22            1 SEA ABB=ON  L20 AND ?OXYPHENYL?
L23            4 SEA ABB=ON  (L12 OR L13 OR L14) OR L22
                 D ALL 1-4

FILE 'REGISTRY' ENTERED AT 11:25:24 ON 03 DEC 2009
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                 844886-70-0 OR 31110-89-1 OR 695169-64-3 OR 844886-59-5 OR
                 844886-60-8 OR 844886-61-9 OR 844886-62-0 OR 844886-63-1 OR
                 844886-64-2 OR 887781-97-7 OR 887781-97-7 OR 887781-98-8)/RN
L25            1 SEA ABB=ON  (695170-05-9 OR 695170-25-3 OR 844886-65-3 OR
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L26           14 SEA ABB=ON  (695170-02-6 OR 695170-07-1 OR 695170-09-3 OR
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                 944131-74-2 OR 944131-76-4 OR 944131-77-5 OR 944131-64-0 OR 944131-76-4)/RN
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                 944131-68-4 OR 944131-66-2 OR 944131-70-8 OR 944131-72-0 OR
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L32           15 SEA ABB=ON  (695169-57-4 OR 695169-60-9 OR 695169-62-1 OR
                 695169-64-3 OR 695169-65-4 OR 695169-67-6 OR 695169-69-8 OR
                 695169-71-2 OR 695169-75-6 OR 695169-77-8 OR 695169-79-0 OR
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FILE 'HCAPLUS' ENTERED AT 11:26:33 ON 03 DEC 2009
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L36            8 SEA ABB=ON  (695170-05-9 OR 695170-25-3 OR 844886-65-3 OR
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L39            3 SEA ABB=ON  (944131-85-5 OR 944131-81-1 OR 944131-86-6 OR
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                 944131-68-4 OR 944131-66-2 OR 944131-70-8 OR 944131-72-0 OR
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                 695169-71-2 OR 695169-75-6 OR 695169-77-8 OR 695169-79-0 OR
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L41            6 SEA ABB=ON  (695169-97-2 OR 695169-99-4 OR 844886-57-3 OR
                 844886-59-5 OR 844886-55-1 OR 844886-57-3 OR 844886-58-4 OR
                 844886-61-9 OR 844886-63-1 OR 844886-64-2 OR 845507-59-7 OR
                 944131-85-5 OR 944131-82-2 OR 944131-87-7 OR 944131-66-2 OR 944131-68-4)/RN
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L43            9 SEA ABB=ON  L42 NOT L23
                 D ALL 1-9
                 E MORIN J, 2001/RE
L44            3 SEA ABB=ON  (MORIN? AND LECLERC?)/AU AND 2001/PY
                 D ALL 1-3
L45           14 SEA ABB=ON  (MORIN? AND LECLERC?)/AU AND 2002/PY
L46            0 SEA ABB=ON  L45 AND MACROMOLECULES/JN
L47            0 SEA ABB=ON  L45 AND MACROMOLECULES
L48            0 SRA ABB=ON  L45 AND V34
L49            0 SEA ABB=ON  L45 AND V35
L50            0 SEA ABB=ON  L45 AND 8413
                 E MORIN J, 2002/RE
L51            2 SEA ABB=ON  L45 AND MACROMOLECULES/JT
                 D ALL 1-2
L52           14 SEA ABB=ON  (MORIN? AND LECLERC?)/AU AND 2002/PY
L53            1 SEA ABB=ON  L52 AND MACROMOLECULAR RAPID COMMUNICATIONS/JT
                 D ALL
L54            1 SEA ABB=ON  (MORIN? AND TAO? AND LECLERC?)/AU AND 2002/PY
                 D ALL
L55            0 SEA ABB=ON  (MORIN? AND BEAUPRE? AND LEVESQUE?)/AU AND 2002/RE
L56            0 SEA ABB=ON  (MORIN? AND LEVESQUE?)/AU AND 2002/RE
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Same Inventors + Assignee as 10/573,883

L51 ANSWER 1 OF 2 COPYRIGHT ACS on STN
AN 2002:737955 HCAPLUS
TI 2,7-Carbazole-Based Conjugated Polymers fc ight Emission
AU **Morin, Jean-Francois; Leclerc, Mario**
CS Centre de Recherche en Sciences et Ingenierie des Macromolecules, Departement de Chimie, Universite Laval, Quebec City, QC, G1K 7P4, Can.
SO **Macromolecules** (2002), 35(22), 8413-8417
CODEN: MAMOBX; ISSN: 0024-9297
PB American Chemical Society
DT Journal
LA English
AB Light-emitting 2,7-carbazole-based homopolymers and copolymers were prepared by Yamamoto or Suzuki cross-coupling reaction. **Poly(N-(2-ethylhexyl)-2,7-carbazole) (PEHC), poly(N-octadecyl-2,7-carbazole) (PODC), and poly(N-(2-ethylhexyl)-2,7-carbazole-alt-4-heptyl-2,5-pyridine) (PCPy) emit blue light while poly(N-(2-ethylhexyl)-2,7-carbazole-alt-2,3-diheptyl-5,8- quinoxaline) (PCQ) and poly(N-(2-ethylhexyl)-2,7-carbazole-alt- 3,3',4''',3''''-tetramethyl-3'',4''-dihexyl- 2,2':5',2'':5'',2''':5''',2''''-quinquethiophene-1'',1''-dioxide) (PCPTO) emit green and red light, resp.** The fluorescence quantum yield in chloroform solution ranges from 25% for PCPTO to 83% for PCQ. All these 2,7-carbazole-based polymers do not show any evidence of excimer formation in the solid state. Most of these polymers exhibit a glass transition at ca. 60-70 °C with a degradation temperature above 385 °C. These new polymeric materials should allow the development of efficient blue-, green-, and red-light-emitting diodes with improved optical stability.
IT Fluorescence
Glass transition temperature
UV and visible spectra
(of 2,7-carbazole-based conjugated polymers for blue, green, and red light emission)
IT Suzuki coupling reaction
(used in the preparation of 2,7-carbazole-based conjugated polymers for blue, green, and red light emission)
IT 353276-27-4P 353276-28-5P 444289-49-0P,
Poly(9-octyl-9H-carbazole-2,7-diyl) 476360-82-4P 476360-85-7P
476360-86-8P 476360-88-0P 476360-89-1P 476360-90-4P 476360-91-5P
476614-67-2P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(preparation of 2,7-carbazole-based conjugated polymers for blue, green, and red light emission using Yamamoto or Suzuki cross-coupling reaction)

Same Assignee + Inventors as 10/573,883

L44 ANSWER 2 OF 3 COPYRIGHT ACS on STN
AN 2001:404859 HCAPLUS
TI Syntheses of Conjugated Polymers Derived from N-[illegible]
AU **Morin, Jean-Francois; Leclerc, Mario**
CS Canada Research Chair in Polymer Chemistry Department of Chemistry Centre de Recherche en Sciences et Ingenierie des Macromolecules, Universite Laval, Quebec City, QC, G1K 7P4, Can.
SO Macromolecules (2001), 34(14), 4680-4682
PB American Chemical Society
DT Journal
LA English
AB **N-alkyl-2,7-dichlorocarbazoles** were prepared in three straightforward steps, Suzuki coupling, reductive Cadogan ring closure, and alkylation. Homopolymns. were achieved by reductive Yamamoto reaction of N-alkyl-2,7-dihalo-carbazoles in the presence of P(Ph)3, Zn, 2,2'-bipyridine, and NiCl2 catalyst system. Alternating conjugated copolymers were prepared by Suzuki coupling of diboronic functionalized aromatic compds. and N-alkyl-2,7-diiodocarbazole (or dibromo) derivs. The resulting conjugated poly(N-octyl-2,7-carbazole-alt-9,9-dioctyl-2,7- fluorene)s are completely soluble in common organic solvents, such as chloroform and THF. However, poly(N-octyl-2,7-carbazole) and poly[N-(2-ethylhexyl)-2,7-carbazole] are only partially soluble (ca. 50 % fraction) and an even smaller fraction (ca. 10 %) of poly[N-(2-ethylhexyl)-2,7-carbazole-alt-5,5'-(2,2'-bithiophene)] is soluble in these solvents. In dilute solns. or as thin films poly(N-octyl-2,7-carbazole) exhibits an absorption maximum around 380-390 nm, leading to a pale yellow color and does not exhibit thermochromic or solvatochromic properties, however it has an intense blue emission upon radiative excitation, with a quantum yield of about 80% in chloroform, at room temperature The pale yellow poly(N-octyl-2,7-carbazole-alt-9,9-dioctyl-2,7-fluorene) exhibits solution and solid-state blue emission (without the presence of excimer) with a maximum at 417 and 450 nm, resp. Poly[N-(2-ethylhexyl)-2,7-carbazole-alt-5,5'-(2,2'-bithiophene)] emits a green radiation with a maximum of emission at 504 nm, the fluorescence quantum yield is 30%. Structural modifications through the synthesis of alternating copolymers makes it feasible to develop tunable light-emitting polymers.
IT Heterocyclization
(Cadogan; coupling-ring closure-alkylation route in preparation of N-alkylcarbazoles and coupling polymerization to obtain conjugated homopolymers and copolymers with bithiophene)
IT 6402-13-7P, 2,7-Diaminocarbazole 102871-58-9P 192942-45-3P 344863-34-9P 353276-18-3P 353276-21-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(intermediate; coupling-ring closure-alkylation route in preparation of N-alkylcarbazoles and coupling polymerization to obtain conjugated homopolymers and copolymers with bithiophene)

Same Assignee + Inventors as 10/573,883

L51 ANSWER 2 OF 2 COPYRIGHT ACS on STN
AN 2002:101801 HCAPLUS
TI Electrochemical, conductive, and magnetic pro
2,7-carbazole-based conjugated polymers
AU Zotti, Gianni; Schiavon, Gilberto; Zecchin, Sandro; **Morin, Jean-Francois; Leclerc, Mario**
CS Istituto di Polarografia ed Elettrochimica Preparativa, Consiglio Nazionale delle Ricerche, Padua, 35020, Italy
SO **Macromolecules (2002)**, 35(6), 2122-2128
CODEN: MAMOBX; ISSN: 0024-9297
PB American Chemical Society
DT Journal
LA English
AB Novel poly(2,7-carbazole)s (i.e., poly(N-octyl-2,7-carbazole-diyl) and poly(N-(4-hexyl-benzoyl)-2,7-carbazole-diyl)) and their alternating thiophene, bi-thiophene, and 3,4-ethylenedioxy-2,5-thienylene copolymers have been investigated by cyclic voltammetry, UV-vis spectroelectrochem., electrochem. quartz crystal microbalance, in-situ ESR, and in-situ conductivity techniques. All polymer films undergo reversible oxidation and partially reversible reduction processes. In poly(N-octyl-2,7-carbazole-diyl), two isoelectronic oxidation processes produce radical cations and dication with charge localization at the carbazole subunits. The presence of a strong electron-withdrawing substituent onto the nitrogen atom in the homopolymer leads to an increase by 3 orders of magnitude of the conductivity (i.e., 1 + 10-2 S/cm). Similarly, in alternating copolymers, the oxidative charge is more delocalized over the polyconjugated backbone with in-situ conductivities in the range of 4 + 10-2-4 + 10-3 S/cm.
ST carbazole thiophene conjugated polymer prepn oxidn cyclic voltammetry cond
IT Cyclic voltammetry
ESR (electron spin resonance)
Optical absorption
Oxidation
Oxidation potential
Polymerization catalysts
Redox potential
(2,7-carbazole-based conjugated polymers)
IT Band gap
Electric conductivity
(electrochem. and optical; 2,7-carbazole-based conjugated polymers)
IT Conducting polymers
(polythiophenes, carbazole group-containing; 2,7-carbazole-based conjugated polymers)
(2,7-carbazole-based conjugated polymers)
IT 50606-95-6, 4-Hexylbenzoyl chloride 102871-58-9, 2,7-Dichlorocarbazole
RL: RCT (Reactant); RACT (Reactant or reagent)
(monomer synthesis; 2,7-carbazole-based conjugated polymers)
IT 406726-90-7P 406726-91-8P 406726-92-9P 406726-93-0P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(monomer; 2,7-carbazole-based conjugated polymers)
IT 603-35-0, Triphenylphosphine, uses 7447-41-8, Lithium chloride, uses 13965-03-2, Bis(triphenylphosphine)palladium dichloride 14221-01-3, Tetrakis(triphenylphosphine)palladium
RL: CAT (Catalyst use); USES (Uses)
(polymerization catalyst; 2,7-carbazole-based conjugated polymers)

Same Inventors
+
Assignees as
10/573,883

L53 ANSWER 1 OF 1 COPYRIGHT ACS on STN
AN 2003:109505 HCAPLUS
TI Blue-light-emitting conjugated polymers derived from 2,7-carbazoles
AU **Morin, Jean-Francois**; Boudreault, Pierre-Luc; **Leclerc, Mario**
CS Canada Research Chair in Electroactive and Photoactive Polymers, Centre de recherche en sciences et ingenierie des macromolecules, Departement de chimie, Universite Laval, Quebec City, QC, G1K 7P4, Can.
SO **Macromolecular Rapid Communications (2002)**, 23(17), 1032-1036
CODEN: MRCOE3; ISSN: 1022-1336
PB Wiley-VCH Verlag GmbH & Co. KGaA
DT Journal
LA English
CC 35-5 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36, 73
AB Blue-light-emitting 2,7-carbazole-based conjugated copolymers have been prepared by Yamamoto or Suzuki cross-coupling reactions. By introducing highly substituted aromatic comonomers, fully soluble high-mol.-weight copolymers have been obtained. Moreover, these amorphous polymeric materials exhibit good thermal stability and interesting redox properties. All these features make these new conjugated polymers highly promising for the development of single-polymer-layer blue-light-emitting diodes.
ST carbazole contg conjugated polymer synthesis optical thermal electrochem property; blue light emitting diode carbazole contg conjugated polymer
IT UV absorption
(UV-visible; of blue-light-emitting conjugated polymers derived from 2,7-carbazoles)
IT Electroluminescent devices
(blue-emitting; blue-light-emitting conjugated polymers derived from 2,7-carbazoles)
IT Polymers, preparation
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(conjugated; blue-light-emitting conjugated polymers derived from 2,7-carbazoles)
IT Band gap
Fluorescence
Glass transition temperature
HOMO (molecular orbital)
LUMO (molecular orbital)
Luminescence, electroluminescence
Oxidation potential
Polymer chains
Reduction potential
Thermal stability
(of blue-light-emitting conjugated polymers derived from 2,7-carbazoles)
IT Band gap
(optical; of blue-light-emitting conjugated polymers derived from 2,7-carbazoles)
IT 515821-39-3P 515821-40-6P 515821-42-8P 515821-43-9P 524944-11-4P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(blue-light-emitting conjugated polymers derived from 2,7-carbazoles)

US Provisional Patent Filing date 8/15/03

Same Inventors + Assignees as 10/573,883

L23 ANSWER 3 OF 4 COPYRIGHT ACS on STN
AN 2005:158637 HCAPLUS
TI Monomers, oligomers and polymers of 2-functionalized and 2,7-difunctionalized carbazoles
IN **Leclerc, Mario; Morin, Jean-Francois**
PA Universite Laval, Can.
SO PCT Int. Appl., 72 pp.
DT Patent
LA English

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2005016882	A1	20050224	WO 2004-CA1509	20040816
	CA 2535497	A1	20050224	CA 2004-2535497	20040816
	EP 1660450	A1	20060531	EP 2004-761673	20040816
	JP 2007502251	T	20070208	JP 2006-522863	20040816
	~~US 20070069197~~	~~A1~~	~~20070329~~	US 2006-568303	20061020
PRAI	**US 2003-495113P**	P	**20030815**		
	WO 2004-CA1509	W	20040816		

AB The present invention relates to 2-functionalized and 2,7-difunctionalized carbazoles and 2,7 -carbazolenevinylene oligomers and polymers. More specifically, the present invention relates to a compound of formula (I): wherein R1 is selected from the group consisting of H, alkyl, and aryl; and wherein R2 and R3 are independently selected from the group consisting of H, alkyl, formyl, hydroxymethyl, trityloxymethyl, acetonitrile, chloromethyl, methylphosphonate, methyltriphenylphosphonium and vinyl. The oligomers and polymers are used in field-effect transistors, light-emitting devices such as light-emitting diodes, and solar cells.

IT **Electroluminescent devices**
Field effect transistors
Solar cells
(production of monomers, oligomers and polymers of 2-functionalized and 2,7-difunctionalized carbazoles)

IT 695170-02-6P, N-Hexyl-2,7-bis(vinylenephenylene)carbazole 695170-07-1P, N-Hexyl-2,7-bis(vinylene-(**N-hexyl-2-carbazole**))carbazole 695170-11-7P, 5,5'-Bis(vinylene-(**N-hexyl-2-carbazole**))-2,2'-bithiophene 695170-14-0P, N-(2-Ethylhexyl)-2,7-bis(vinylene-4-(1,1 '-biphenylene))carbazole 695170-16-2P, N-Hexyl-2,7-bis(cyanovinylenephenylene)carbazole 695170-18-4P 695170-20-8P 695170-23-1P, 2,5-Dioctyloxy-1,4-diformylbenzene-N-(2-ethylhexyl)-2,7-bis(acetonitrile)carbazole copolymer 695170-25-3P 844886-65-3P, 1,4-Bis(vinylene-(N-**methyl-7-hexyl-2-carbazole**))phenylene 844886-66-4P, N-(2-Ethylhexyl)-2,7-bis(formyl)carbazole homopolymer 844886-67-5P, Poly(N-(2-**ethylhexyl**)-2,7-**carbazolenevinylene**) 844886-68-6P, 2,5-Dioctyloxy-1,4-diformylbenzene-N-(2-ethylhexyl)-2,7-bis(methyltriphenylphosphonium chloride)carbazole copolymer 844886-70-0P 844886-71-1P 844886-72-2P, 6,6'-Dibromo-2,2'-bis(2"-ethylhexyloxy)-1,1'-binaphthyl-N-(2-ethylhexyl)-2,7-divinylcarbazole copolymer 844886-73-3P 844886-74-4P, 3-Hexyl-2,5-bis(diethyl methylphosphonate)thiophene-N-(4-octyloxyphenyl)-2,7-bis(formyl)carbazole copolymer 845507-59-7P
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(production of monomers, oligomers and polymers of 2-functionalized and 2,7-difunctionalized carbazoles)

Date too New
Same Assignee + Inventors
as 10/573,883

L3 ANSWER 1 OF 4 COPYRIGHT ACS on STN
AN 2005:1178703 HCAPLUS
TI 2,7-carbazolenevinylene-based oligomer thin-film transistor mobility through structural ordering
AU Drolet, Nicolas; Morin, Jean-Francois; Leclerc, Nicolas; Wakim, Salem; Tao, Ye; Leclerc, Mario
CS Canada Research Chair on Electroactive and Photoactive Polymers Departement de Chimie Centre de Recherche en Sciences et Ingenierie des Macromolecules Universite Laval, Quebec City, QC, G1K 7P4, Can.
SO Advanced Functional Materials (2005), 15(10), 1671-1682
PB Wiley-VCH Verlag GmbH & Co. KGaA
DT Journal
LA English
AB We have fabricated **organic field-effect transistors** based on thin films of 2,7-carbazole **oligomeric semiconductors 1,4-bis(vinylene-(N-hexyl-2-carbazole))phenylene (CPC), 1,4-bis(vinylene-(N'-methyl-7'-hexyl-2'-carbazole))benzene (RCPCR), N-hexyl-2,7-bis(vinylene-(N-hexyl-2-carbazole))carbazole (CCC),** and **N-methyl-2,7-bis(vinylene-(7-hexyl-N-methyl-2-carbazole))carbazole (RCCCR). The organic** semiconductors are deposited by thermal evaporation on bare and chemical modified silicon dioxide surfaces (SiO2/Si) held at different temps. varying from 25 to 200°C during deposition. The resulting thin films have been characterizing using UV-vis and Fourier-transform IR spectroscopies, SEM, and X-ray diffraction, and the observed top-contact transistor performances have been correlated with thin-film properties. We found that these new π-conjugated oligomers can form highly ordered structures and reach high hole mobilities. Devices using CPC as the active semiconductor have exhibited mobilities as high as 0.3 cm2V-1s-1 with on/off current ratios of up to 107. These features make CPC and 2,7-carbazolenevinylene-based oligomers attractive candidates for device applications.
IT Crystallization temperature
Electric current-potential relationship
Field effect transistors
Hole mobility
Thin film transistors
(carbazolenevinylene-based oligomer thin-film transistors and high mobility through structural ordering)
IT Electric current carriers
(mobility; carbazolenevinylene-based oligomer thin-film transistors and high mobility through structural ordering)
IT 844886-65-3P
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(RCPCR; carbazolenevinylene-based oligomer thin-film transistors and high mobility through structural ordering)
IT 31110-89-1P 695169-64-3P 844886-59-5P 844886-60-8P 844886-61-9P 844886-62-0P 844886-63-1P 844886-64-2P 887781-97-7P 887781-98-8P
RL: PNU (Preparation, unclassified); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(carbazolenevinylene-based oligomer thin-film transistors and high mobility through structural ordering)
IT 4546-04-7 105365-50-2 695169-57-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(carbazolenevinylene-based oligomer thin-film transistors and high mobility through structural ordering)

Date too new
Same Assignees
+Inventors as
10/573,883

L23 ANSWER 1 OF 4 COPYRIGHT ACS on STN
AN 2006:1007606 HCAPLUS
TI Synthesis of 2,7-carbazolenevinylene-based copolymers and of their **photovoltaic** properties
AU Leclerc, Nicolas; Michaud, Alexandre; Sirois, Kathleen; Morin, Jean-Francois; Leclerc, Mario
CS Departement de Chimie Centre de Recherche en Sciences et Ingenieries des Macromolecules, Universite Laval, Quebec City, QC, G1K 7P4, Can.
SO Advanced Functional Materials (**2006**), 16(13), 1694-1704
PB Wiley-VCH Verlag GmbH & Co. KGaA
DT Journal
LA English
AB New electroactive and photoactive conjugated copolymers consisting of alternating 2,7-carbazole and oligothiophene moieties linked by vinylene groups were developed. Different oligothiophene units were introduced to study the relation between the polymer structure and the electronic properties. The resulting copolymers are characterized by UV-visible spectroscopy, size-exclusion chromatog., and thermal and electrochem. analyses. Bulk heterojunction photovoltaic cells from different copolymers and a soluble fullerene derivative, [6,6]-phenyl-C61 butyric acid Me ester, were fabricated, and promising preliminary results are obtained. For instance, nonoptimized devices using **poly(N-(4-octyloxyphenyl)-2,7-carbazolenevinylene-alt-3'',4''-dihexyl-2,2';5',2'';5'',2'''; 5''',2''''-quinquethiophenevinylene 1'',1''-dioxide)** as an absorbing and hole-carrier semiconductor exhibit power conversion efficiency up to 0.8% under air mass (AM) 1.5 illumination. These features make 2,7-carbazolenevinylene-based and related polymers attractive candidates for **solar-cell applications.**
IT Solar energy
(conversion, efficiency; synthesis of **2,7-carbazolenevinylene-based copolymers** and characterization of their photovoltaic properties)
IT Amorphous semiconductors
Heterojunction solar cells
Semiconductor films
(synthesis of 2,7-carbazolenevinylene-based copolymers and characterization of their photovoltaic properties)
IT 944131-81-1P 944131-86-6P
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**PCVTT**; synthesis of 2,7-carbazolenevinylene-based copolymers and characterization of their photovoltaic properties)
IT 944131-82-2P 944131-87-7P
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**PCVTTTT**; synthesis of 2,7-carbazolenevinylene-based copolymers and characterization of their photovoltaic properties)
IT 3779-27-9P, 5-Formyl-2,2'-bithiophene 120762-66-5P, 4,4'-Dioctyl-2,2'-bithiophene 161746-04-9P 165393-20-4P 204700-93-6P, 4-Octyl-2-Trimethyltinthiophene 227464-61-1P, 3',4'-Dihexyl-2,2':5',2''-terthiophene-1',1'-dioxide 844886-56-2P, **N-(4-Octyloxyphenyl)-2,7-bis(hydroxymethyl)carbazole** 844886-57-3P, **N-(4-Octyloxyphenyl)-2,7-bis(formyl)carbazole** 944131-62-8P 944131-66-2P 944131-68-4P 944131-70-8P 944131-72-0P 944131-74-2P 944131-76-4P 944131-77-5P
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PUR PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(synthesis of 2,7-carbazolenevinylene-based copolymers and characterization of their photovoltaic properties)

Date too New
Same Inventors + Assignee as 10/573,883

L23 ANSWER 4 OF 4 COPYRIGHT ACS on STN
AN 2004:471220 HCAPLUS
TI Syntheses and Characterization of Electroactive and Photoacti
2,7-Carbazolenevinylene-Based Conjugated Oligomers and Polyme
AU **Morin, Jean-Francois; Drolet, Nicolas; Tao, Ye; Leclerc, Mario**
CS Canada Research Chair in Electroactive and Photoactive Polymers Centre de Recherche en Sciences et Ingenierie des Macromolecules Departement de Chimie, Universite Laval, Quebec City, QC, G1K 7P4, Can.
SO Chemistry of Materials (**2004**), 16(23), 4619-4626
CODEN: CMATEX; ISSN: 0897-4756
PB American Chemical Society
DT Journal
LA English
AB This study reports the first syntheses and characterization of 2,7-carbazolenevinylene-based oligomers and polymers. Their relatively straightforward syntheses are mainly based on Horner-Emmons or Knoevenagel coupling reaction leading to well-defined oligomers and polymers. As expected, introduction of vinylene and cyanovinylene unit into the polymer backbone decreases the band gap allowing a fine-tuning of the optical and elec. properties. These electroactive and photoactive organic materials exhibit promising performances in light-emitting devices and field-effect transistors. For instance, preliminary measurements using **poly(N-(2-ethylhexyl)-2,7-carbazolenecyanovinylene-alt-2,5-dioctyloxy-1,4- phenylenevinylene) (PCCVP)** have revealed orange-red emission with an intensity of 245 cd/m2 at 10 V, whereas p-type mobility of about 3.7 + 10-2 cm2/V·s and an on/off ratio as high as 106 were reached with **1,4-bis(vinylene-(N-hexyl-2- carbazole))phenylene (CPC).**
IT Electric current carriers
(mobility; syntheses and characterization of electroactive and photoactive 2,7-carbazolenevinylene-based conjugated oligomers and polymers used in LEDs and FETs)
IT Band gap
Electroluminescent devices
Electronic transition
Field effect transistors
Luminescence, electroluminescence
Oxidation, electrochemical
Polymerization
UV and visible spectra
(syntheses and characterization of electroactive and photoactive 2,7-carbazolenevinylene-based conjugated oligomers and polymers used in **LEDs and FETs)**
IT 9003-53-6D, sulfonated
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(dopant for PEDOT; syntheses and characterization of electroactive and photoactive 2,7-carbazolenevinylene-based conjugated oligomers and polymers and their use in LEDs containing)